



**National Aeronautics
and Space Administration**

June 6, 1997

NRA 97-OSS-11

Research Announcement

Research in Exobiology

Proposals Due:

September 5, 1997

OMB Approval No. 2700-0087

**NASA Research Announcement
Soliciting Basic Research
in
Exobiology**

**NRA 97-OSS-11
Issued: June 6, 1997
Proposals Due: September 5, 1997**

**Office of Space Science
National Aeronautics and Space Administration
Washington, DC 20546-0001**

Research in Exobiology

This NASA Research Announcement (NRA) solicits proposals for basic research in the area of exobiology: the study of the origin, evolution, and distribution of life in the universe.

Participation in the Exobiology Program is open to all individuals and all categories of organizations, both domestic and foreign, industry, educational institutions, other nonprofit organizations, NASA laboratories, and other Government agencies. Proposals may be submitted at any time according to the schedule below. Proposals will be evaluated by scientific peer review during the fall of 1997. Grants or contracts, as appropriate, will be awarded during Federal Fiscal Year 1998, pending availability of funds, to projects selected for funding.

Further details relevant to this program are included in the appendices to this Announcement.

- Appendix A: Description of the Exobiology Program
- Appendix B: Guidelines for Responding to NRA
- Appendix C: Planetary Instrument Upgrade Program
- Appendix D: Forms for Proposal Submission

Appendix A provides technical and program information applicable only to this NRA in the general areas in which proposals are solicited, plus amendatory guidance to Appendix B. Appendix B contains the basic guidance needed for the preparation of solicited proposals in response to an NRA. Appendix C contains guidelines of the Planetary Instrument Upgrade Program (PIUP) for requesting major equipment purchases to support proposed research. Appendix D contains formats for supplementary information required with proposals submitted in response to this NRA.

The full text of the NRA and all appendices are available electronically via the World Wide Web at URL <<http://www.hq.nasa.gov/office/oss/>>, open "Research Opportunities" from the menu. Paper copies of the NRA and appendices are available from Dr. Michael Meyer at the address given below.

The following items apply only to this Announcement.

Identifier:	NRA 97-OSS-11
Proposals due:	September 5, 1997
Submit signed original and 15 proposal copies to:	Exobiology Review Panel Lunar and Planetary Institute (LPI) 3600 Bay Area Boulevard Houston, TX 77058 (713) 486-2149

Selecting official:

Director
Research Program Management
Division
Office of Space Science

Obtain additional information from:

Michael A. Meyer, Ph.D.
Exobiology Program
Research Program Management
Division
Code SR
NASA Headquarters
Washington, DC 20546-0001
(202) 358-0307
Fax: (202) 358-3097
e-mail: michael.meyer@hq.nasa.gov

Funds are not presently available for awards under this NRA. The Government's obligation to make awards is contingent upon the submission of qualified proposals and the availability of appropriated funds from which payment for award purposes can be made. It is estimated that approximately \$9 M may be available within the scope of this NRA to support the Exobiology Program.

Your interest and cooperation in participating in this effort are appreciated.

Jurgen H. Rahe
Science Program Director
Solar System Exploration
Office of Space Science

Edward J. Weiler
Science Program Director
Astronomical Search for Origins and
Planetary Systems
Office of Space Science

APPENDIX A
NRA 97-OSS-11

DESCRIPTION OF THE EXOBIOLOGY PROGRAM

I.SCOPE OF THE EXOBIOLOGY PROGRAM

The goal of NASA's Exobiology Program is to understand the origin, evolution, and distribution of life in the universe. Research is focused on achieving this goal by tracing the pathways taken by the biogenic elements, leading from the origin of the universe through the major epochs in the evolution of living systems and their precursors. These epochs (*and the approximate percentage of exobiology research funding historically allocated to each*) are: 1) The cosmic evolution of the biogenic compounds (15%); 2) prebiotic evolution (35%); 3) the early evolution of life (35%); and 4) the evolution of advanced life (15%).

The principal goal of research in the area of the cosmic evolution of the biogenic compounds is to determine the history of the biogenic elements (C, H, N, O, P, S) from their birth in stars to their incorporation into planetary bodies. Emphasis is placed on studies that constrain or extend concepts of possible chemical evolution relevant to the origin, evolution, and distribution of life.

Research in the area of prebiotic evolution seeks to understand the pathways and processes leading from the origin of a planet to the origin of life. The strategy is to investigate the planetary and molecular processes that set the physical and chemical conditions within which living systems arose. Four major objectives are to: 1) determine constraints on prebiotic evolution imposed by the physical and chemical histories of planets; 2) develop models of active boundary regions in which chemical evolution could have occurred; 3) determine what chemical systems could have served as precursors of metabolic and replicating systems both on Earth and elsewhere; and 4) determine in what forms prebiotic organic matter has been preserved in planetary materials.

The goal of research into the early evolution of life is to determine the nature of the most primitive organisms, the environment in which they evolved, and the way in which they influenced that environment. As an approach to understanding life in the universe, the opportunity is taken to investigate two natural repositories of evolutionary history available on Earth: the molecular record in living organisms and the geological record in rocks. These paired records are used to: 1) determine when and in what setting life first appeared; 2) determine the characteristics of the first successful living organisms; 3) understand the phylogeny and physiology of microorganisms thought to be analogs of primitive environments; 4) determine the original nature of biotic energy transduction, membrane function, and information processing through study of extant microbes; and 5) elucidate the physical, chemical, and biotic forces operating on microbial evolution.

The research associated with the study of the evolution of advanced life seeks to determine the extrinsic factors influencing the development of advanced life and its potential distribution. This research includes an evaluation of the influence of extraterrestrial and planetary processes on the appearance and evolution of multicellular life, conducted by: 1) tracing the effects of major changes in the Earth's environment on the evolution of complex life, especially during mass extinction events,

and 2) determining the effects of global events and of events originating in space on the production of environmental changes that affected the evolution of multicellular life. Also, studies will be considered that would seek approaches to investigations furthering our understanding of the distribution of life elsewhere in the universe.

II. PROGRAM MANAGEMENT INFORMATION

Proposals are sought for new projects within the scope of the Exobiology Program. Proposals submitted in response to this NRA should be for work that is not currently supported by the Exobiology Program as well as is currently funded in the Exobiology Program but whose grant is expiring and is seeking continued funding for similar research. Periods of performance from 1-5 years (typically 3 years) may be proposed, if appropriate to the nature of the contemplated research. Proposers are reminded that programmatic balance (see historical percentages above) may limit the opportunities for funding in some areas. **Progress reports** for funding the second or subsequent years of research, for previously approved multiple year awards, **will be considered separately and should be sent directly to the Exobiology Program manager 90 days before the funding anniversary date.**

III. EQUIPMENT UPGRADE

Funds are available under the Planetary Instrument Upgrade Program (PIUP) to provide for upgrading of analytical instruments required by investigations sponsored by the Exobiology Program. New, major analytical instrumentation that is necessary for the conduct of proposed research, or that would substantially improve its quality, should be identified and requested in a special section of each proposal, to be titled "Major Equipment Request." Details of specific guidelines, restrictions, and exclusions are provided in Appendix C of this NRA.

IV. SUPPLEMENTARY PROPOSAL PREPARATION INFORMATION

A. The "Conformance to Guidance" and "Proposal Contents" sections of Appendix B are modified as follows:

The first three pages of the proposal constitute summary sheets and, for ease of evaluation, should approximate the first three sample formats given in Appendix D. Only applicable headings and material need be included. Note that the "Transmittal Letter or Prefatory Material" sections still apply and that complete, detailed budgets and cost breakdowns, as necessary, must still appear in the main body of the proposal. At least one copy of the proposal must bear the signature of a responsible official or authorized representative of the proposing organization authorized to contractually commit or obligate the organization. The remainder of the proposal immediately following the summary pages (with the exception of the abstract) should be prepared in accordance with the instructions in Appendix B, except as noted below.

With each proposal, there should be included a signed certification regarding drug-free workplace requirements and a certification regarding debarment and suspension requirements. If the proposal budget is for a cumulative amount of \$100,000 or more, there must also be a certification regarding lobbying. Examples are included in Appendix D.

B. The following paragraphs are added to the "Project Description" section of Appendix B:

This section describes and justifies the proposed research. It should be a clear and concise statement of the research proposed, identifying and relating the key elements. The scientific objectives, the significance of the investigation, and their relevance to exobiology must be clear. Give attention to the nature and amount of experimental data to be collected, as appropriate; describe the methods or approaches to be used; discuss the advantages of the proposed approach over alternatives. When possible, the proposal should be divided into separate tasks that can be carried out independently; these tasks should be enumerated and described. If the investigation cannot be completed within 12 months of the award, the proposal should contain a brief description of work plans and budget requirements for each year of the effort. The proposal should contain sufficient detail to enable a reviewer to make informed judgments about: (1) the relevance of the proposal to the Exobiology Program and to the objectives of the Office of Space Science; (2) the probability that the investigators will be able to accomplish their stated objectives with the resources requested; and (3) the overall merit of the proposed research according to the evaluation factors in Appendix B.

C. The following paragraphs are added to the "Proposed Costs" section of Appendix B:

The proposal should contain budgets for each year of the proposed effort. Sufficient proposal cost detail and supporting information will facilitate a speedy evaluation and award (see Appendix D). Dollar amounts proposed with no explanation (e.g., Equipment: \$58,000, or Labor: \$110,000) cause delays in evaluation and award. The proposal costing information should be sufficiently detailed to allow the Government to identify costed elements for evaluation purposes. Generally, the Government will evaluate costs as to reasonableness, allowability, and allocability. The Proposal Cost Summary should display the desired detail. Each category should be explained. Offerors should exercise prudent judgment as the amount of detail necessary varies with the complexity of the proposal. See additional instructions following the budget sheets in Appendix D.

D. The "Length" section is modified as follows:

Each proposal whether for new work or for the extension of research by previously-funded investigators should be limited to ten (10) single-spaced, typewritten pages not including title pages, abstract, budget summary, references, figures, vita, certifications, and any request for new equipment. Each side of a sheet of paper containing text is considered a page. Text must be in English and use a type font 10

point or larger. If applicable, one set of pertinent reprints or other appendices should be included with each proposal copy submitted.

E. The following is added to the "Evaluation Factors" section of Appendix B:

The evaluation of intrinsic merit will include an assessment of potential impact the research results will have in the relevant scientific field. Emphasis will be placed on those endeavors that will go beyond the "next step" and results of which will enable other scientists to progress in their research.

F. The following section is added to Appendix B:

Guidelines for Non-U.S. Participation

NASA welcomes proposals from outside the U.S. However, investigators working outside the U.S. are not eligible for funding from NASA. Proposals from non-U.S. entities should not include a cost plan. Proposals from outside the U.S. and U.S. proposals that include non-U.S. participation, must be endorsed by the respective government agency or funding/sponsoring institution in that country from which the non-U. S. participant is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA, and if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.

In addition to sending the required number of copies of the proposals to the designated address, one copy of the proposal, along with a Letter of Endorsement from the sponsoring non-U.S. agency, must be forwarded to:

Ms. Bettye Jones
(NRA 97-OSS-11)
International Science and Aeronautics Division
Code IS
NASA Headquarters
Washington, DC 20546-0001
USA

All proposals must be typewritten in English. All non-U.S. proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date; those received after the closing date will be held for the next proposal cycle. Sponsoring non-U.S. agencies may, in exceptional situations, forward a proposal without endorsement to the above address if endorsement is not possible before the announced closing date. In such cases, however, NASA's International Science and Aeronautics Division should be advised when a decision on endorsement can be expected.

Successful and unsuccessful proposers will be contacted directly by the NASA Research Program Management Division. Copies of these letters will be sent to the sponsoring government agency. Should a non-U.S. proposal or a U.S. proposal with non-U.S. participation be selected, NASA's International Science and Aeronautics

Division will arrange with the non-U.S. sponsoring agency for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency will each bear the cost of discharging their respective responsibilities. Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

1. a letter of notification by NASA; and
2. an exchange of letters between NASA and the sponsoring governmental agency, or
3. a formal Agency-to-Agency Memorandum of Understanding (MOU)

V. EDUCATION AND PUBLIC OUTREACH

“Partners in Education: A Strategy for Integrating Education and Public Outreach Into NASA’s Space Science Programs” describes the Office of Space Science’s approach for making education at all levels and the enhancement of the public understanding of science integral parts of space science research activities. The follow-on implementation plan, “Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy,” produced by the Education/Public Outreach Task Force of the Space Science Advisory Committee (SSAC) was published October 15, 1996. Copies of the OSS educational outreach strategy and the implementation plan may be obtained from Dr. Jeffrey D. Rosendhal, Office of Space Science, Code S, NASA Headquarters, Washington, DC 20546, E-mail: <jeffrey.rosendhal@hq.nasa.gov> or on the OSS World Wide Web Homepage at URL: <<http://www.hq.nasa.gov/office/oss/>>, select “Publications” from the menu.

Education/public outreach are now expected to be part of each flight program and research discipline. This policy is being implemented through a mixture of mission/project-specific outreach activities, plus education/public outreach activities conducted by individual researchers. NASA strongly encourages researchers to actively engage in education/public outreach and proposers are encouraged to include education/public outreach in their proposals, not to exceed 10% of their proposal.

Scientific excellence of proposed investigations will continue to be the primary selection criterion. Proposals will not be selected solely or primarily on the strength of their education/public outreach component, although the quality of a proposed education/public outreach effort will be used as an additional factor in selecting among equal and scientifically excellent proposals. Evaluation criteria for the education component will include:

- The educational effectiveness and realism of program concept;
- The leverage of existing resources and the prospect for the program to have a multiplier effect;
- The capability of the proposer to carry out proposed program;
- The consistency with National educational reform efforts; and
- The Realism and adequacy of budget.

Attention is also called to the program entitled Initiative to Develop Education through Astronomy (IDEA) that is administered on behalf of OSS by the Space Telescope Institute. This Program provides small grants (typically \$6K but range up to \$20K) to enhance participation of space scientists in precollege or public outreach activities. For more information contact Dr. Anne Kinney, Project Scientist for Education, Space Telescope Institute, 3700 San Martin Drive, Baltimore, MD 21218.

**INSTRUCTIONS FOR RESPONDING TO
NASA RESEARCH ANNOUNCEMENTS**

Part 1852.235-72

NASA Federal Acquisition Regulations (FAR) Supplement (NFS)
Version 89.90, Effective March 11, 1997.

Accessible at URL

<<http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>>,
open Part 1852.228 to 1852.241 from menu.

(JANUARY 1997)

A. General.

(1) Proposals received in response to a NASA Research Announcement (NRA) will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA to be used as the basis of a solicitation or in negotiation with other organizations, nor is a preaward synopsis published for individual proposals.

(2) A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

(3) NRA's contain programmatic information and certain requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NRA's.

(4) A contract, grant, cooperative agreement, or other agreement may be used to accomplish an effort funded in response to an NRA. NASA will determine the appropriate instrument. Contracts resulting from NRA's are subject to the Federal Acquisition Regulation (FAR) and the NASA FAR Supplement (NFS). Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NPG 5800.1).

(5) NASA does not have mandatory forms or formats for responses to NRA's; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

(6) To be considered for award, a submission must, at a minimum, present a specific project within the areas delineated by the NRA; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official

authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

B. NRA-Specific Items. Several proposal submission items appear in the NRA itself: the unique NRA identifier, when to submit proposals, where to send proposals, number of copies required, and sources for more information. Items included in these instructions may be supplemented by the NRA.

C. Proposal Content. The following information is needed to permit consideration in an objective manner. NRA's will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter if it contains substantive information.

(1) *Transmittal Letter or Prefatory Material.*

- (i) The legal name and address of the organization and specific division or campus identification, if part of a larger organization;
- (ii) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;
- (iii) Type of organization: e.g., profit, nonprofit, educational, small business, minority, women-owned, etc.;
- (iv) Name and telephone number of the principal investigator and business personnel who may be contacted during evaluation or negotiation;
- (v) Identification of other organizations that are currently evaluating a proposal for the same efforts;
- (vi) Identification of the NRA, by number and title, to which the proposal is responding;
- (vii) Dollar amount requested, desired starting date, and duration of project;
- (viii) Date of submission; and
- (ix) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization(unless the signature appears on the proposal itself).

(2) *Restriction on Use and Disclosure of Proposal Information.* Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following Notice on the title page of the proposal and specify the information subject to the notice by inserting an appropriate identification in the Notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the Notice.

Notice

Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract(or other agreement) is awarded on the basis of this proposal, the Government shall have the right to use and disclose this information (data) to the extent provided in the contract(or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

(3) *Abstract.* Include a concise (200-300 word if not otherwise specified in the NRA) abstract describing the objective and the method of approach.

(4) *Project Description.*

(i) The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance, relation to the present state of knowledge, and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the plan of work, including the broad design of experiments to be undertaken and a description of experimental methods and procedures. The project description should address the evaluation factors in these instructions and any specific factors in the NRA. Any substantial collaboration with individuals not referred to in the budget or use of consultants should be described. Subcontracting significant portions of a research project is discouraged.

(ii) When it is expected that the effort will require more than one year, the proposal should cover the complete project to the extent that it can be reasonably anticipated. Principal emphasis should be on the first year of work, and the description should distinguish clearly between the first year's work and work planned for subsequent years.

(5) *Management Approach.* For large or complex efforts involving interactions among numerous individuals or other organizations, plans for distribution of responsibilities and arrangements for ensuring a coordinated effort should be described.

(6) *Personnel.* The principal investigator is responsible for supervision of the work and participates in the conduct of the research regardless of whether or not compensated under the award. A short biographical sketch of the principal investigator, a list of principal publications, and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in evaluation of the proposal. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical

personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry-university cooperative arrangements should be described.

(7) *Facilities and Equipment.*

(i) Describe available facilities and major items of equipment especially adapted or suited to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tooling that are proposed for use. Include evidence of its availability and the cognizant Government points of contact.

(ii) Before requesting a major item of capital equipment, the proposer should determine if sharing or loan of equipment already within the organization is a feasible alternative. Where such arrangements cannot be made, the proposal should so state. The need for items that typically can be used for research and non research purposes should be explained.

(8) *Proposed Costs.*

(i) Proposals should contain cost and technical parts in one volume: do not use separate "confidential" salary pages. As applicable, include separate cost estimates for salaries and wages, fringe benefits, equipment, expendable materials and supplies, services, domestic and foreign travel, ADP expenses, publication or page charges, consultants, subcontracts, other miscellaneous identifiable direct costs, and indirect costs. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants, and technicians and other non-professional personnel). Estimate all staffing data in terms of staff-months or fractions of full-time.

(ii) Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired, purpose and estimated number and lengths of trips planned, basis for indirect cost computation (including date of most recent negotiation and cognizant agency), and clarification of other items in the cost proposal that are not self-evident. List estimated expenses as yearly requirements by major work phases.

(iii) Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 1831 (and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

(9) *Security.* Proposals should not contain security classified material. If the research requires access to or may generate security classified information, the submitter will be required to comply with Government security regulations.

(10) *Current Support.* For other current projects being conducted by the principal investigator, provide title of project, sponsoring agency, and ending date.

(11) *Special Matters.*

(i) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(ii) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal. Identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

D. Renewal Proposals

(1) Renewal proposals for existing awards will be considered in the same manner as proposals for new endeavors. A renewal proposal should not repeat all of the information that was in the original proposal. The renewal proposal should refer to its predecessor, update the parts that are no longer current, and indicate what elements of the research are expected to be covered during the period for which support is desired. A description of any significant findings since the most recent progress report should be included. The renewal proposal should treat, in reasonable detail, the plans for the next period, contain a cost estimate, and otherwise adhere to these instructions.

(2) NASA may renew an effort either through amendment of an existing contract or by a new award.

E. Length. Unless otherwise specified in the NRA, effort should be made to keep proposals as brief as possible, concentrating on substantive material. Few proposals need exceed 15-20 pages. Necessary detailed information, such as reprints, should be included as attachments. A complete set of attachments is necessary for each copy of the proposal. As proposals are not returned, avoid use of "one-of-a-kind" attachments.

F. Joint Proposals.

(1) Where multiple organizations are involved, the proposal may be submitted by only one of them. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

(2) Where a project of a cooperative nature with NASA is contemplated, describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. The proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

G. Late Proposals. A proposal or modification received after the date or dates specified in an NRA may be considered if doing so is in the best interests of the Government.

H. Withdrawal. Proposals may be withdrawn by the proposer at any time before award. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

I. Evaluation Factors

(1) Unless otherwise specified in the NRA, the principal elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's objectives, intrinsic merit, and cost.

(2) Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to NASA's mission.

(3) Evaluation of its intrinsic merit includes the consideration of the following factors of equal importance:

(i) Overall scientific or technical merit of the proposal or unique and innovative methods, approaches, or concepts demonstrated by the proposal.

(ii) Offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.

(iii) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives.

(iv) Overall standing among similar proposals and/or evaluation against the state-of-the-art.

(4) Evaluation of the cost of a proposed effort may include the realism and reasonableness of the proposed cost and available funds.

J. Evaluation Techniques. Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases, proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house, others are evaluated by a combination of in-house and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of-interest and protection of proposal information), such as by mail or through assembled panels. The final decisions are made by a NASA selecting official. A proposal which is scientifically and programmatically meritorious, but not selected for award during its initial review, may be included in subsequent reviews unless the proposer requests otherwise.

K. Selection for Award.

(1) When a proposal is not selected for award, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

(2) When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation.

L. Cancellation of NRA. NASA reserves the right to make no awards under this NRA and to cancel this NRA. NASA assumes no liability for canceling the NRA or for anyone's failure to receive actual notice of cancellation.

(End of provision)

MAJOR EQUIPMENT REQUEST
UNDER THE
PLANETARY INSTRUMENT UPGRADE PROGRAM
(PIUP)

MAJOR EQUIPMENT REQUEST

I. INTRODUCTION

The NASA Office of Space Science (OSS) may provide funding for the upgrading of analytical, computational, telescopic, and other instrumentation required by investigations sponsored by the programs in this NRA. New major instrumentation that is necessary for the conduct of proposed research, or that would substantially improve its quality, or would significantly benefit the broad science community, should be identified and requested in a special section of each proposal entitled Major Equipment Request.

In order to make the best possible use of the funds that may be available, proposers who request funds for equipment are encouraged to seek cost sharing where appropriate and to propose collective use where that is reasonable, i.e., instruments that could be made available for use by other qualified members of the planetary science community. Cost-shared proposals would be especially attractive for very high cost instruments, provided the partners provide a written statement regarding long term funding and institutional commitment.

However, proposers need to recognize that NASA interprets cost-sharing arrangements as joint ownership, and that NASA has the option to retain title to instruments acquired under such arrangements. Issues of ownership and title may be especially complicated under arrangements that involve other Federal agencies (e.g., the National Science Foundation). When joint ownership cannot be avoided, and the requested NASA contribution will exceed \$1000, agreement regarding NASA retention of its option to take title, and the conditions under which the option (if retained) will be exercised, shall be reached and documented prior to purchase.

II. EXCLUSIONS AND RESTRICTIONS

Instrumentation or support equipment costing less than approximately \$20,000 is not considered major. Requests for such items should be included in the body of the research proposal to the discipline program. Instrumentation or equipment considered inappropriate includes personal computers or computer peripherals (unless these are integral parts of the instrumentation requested), miscellaneous support equipment, support contracts, and equipment repair where the repair does not involve significant enhancement of the instrument's basic capabilities. Nor should funds be sought to support maintenance and continued operations of any instrument requested. These funds must be requested in the main body of the proposal, not in the Major Equipment Request.

In no event will proposals be considered that seek to design, develop, test, or evaluate new instruments that are to be considered for sale.

III. MAJOR EQUIPMENT REQUEST REQUIREMENTS

A request for major equipment should be written so that it can be reviewed as a stand-alone proposal, although it will be reviewed in connection with the science proposal. This is especially important for proposers who are operating under multiyear approvals and who normally would submit only a progress report proposal. This is also important because equipment requests may also be reviewed by a multidisciplinary group external to the normal review process. All requests should contain a short abstract and sections on project description, management, and costs.

Kinds or classes of instruments that are considered appropriate are listed below. Please note that this list is not intended to be inclusive, but rather illustrative of the range of instrument types (and hence costs) that are appropriate. Requests for instruments not specifically identified in the list will receive equal consideration.

Types and Classes of Instruments that Might be Requested

Solid source, light element, and noble gas mass spectrometers; Electron microprobe; Scanning electron microscope; Transmission electron microscope; Cameca-class ion microprobe; Activation analysis equipment; X-ray fluorescence analyzer; Organic analysis instrumentation; Static high pressure instrumentation; Portable high-speed charge-coupled device for occultation measurements; Telescopic instrumentation; High resolution infrared spectrometer; Large format optical charge-coupled device (2000 x 2000 pixels) with coronagraph; Faint object infrared spectrometer; Near infrared array camera with coronagraph; Instrumentation for planetary atmospheres laboratory studies; Coolable white cells; Tunable dye-laser high resolution spectrometer; Instrumentation for measurement of gas phase reaction rates, photochemical reaction rates and branching rates, and collisional disassociation/ionization/recombination cross-sections.

Project Description

The main body of the request should first identify the instrument to be acquired or developed and the type of use proposed. It should contain a strong justification, including a description of why the instrument is necessary for the investigator's research or how it would enhance that research, citing specific examples wherever possible. It should also demonstrate why the enhanced capability is important to planetary science in general. If an instrument is proposed for the benefit of the science community, the justification should emphasize, as well, how the enhanced capability would benefit the larger planetary science community. All justifications should address how the requested instrument relates to existing capabilities, both in the investigator's own laboratory and to others in the community.

Any substantial collaboration with individuals not referred to in the budget, or use of consultants, should be described. If cost-sharing or substantial institutional contributions are anticipated, this should be described. It should be noted that cost sharing (between NASA and other agencies such as the Department of Energy or the National Science Foundation) is encouraged to the extent that NASA's share of the cost will

ensure adequate use by NASA investigators. This aspect of any proposed cost-sharing acquisition must be discussed in the proposal. If other agencies have been approached or have made tentative commitments, the proposal should document that and provide names and telephone numbers of appropriate officers in those agencies who can discuss their agencies' interest.

When it is expected that the acquisition or development of an instrument or facility will require more than one year, the proposal should cover the complete project but with a clear distinction between the efforts involved in each requested year.

Management

If the instrumentation is intended to be used by the scientific community, in addition to the Principal Investigator, a management section is required. This section should include a description of how the requested instrument would be managed. This description should include a statement of the percentage of the instrument's time that would be available to other users and a general statement regarding aspects of user access, such as time of day when access would be granted, whether access would be hands on or by an operator or collaborator in the PI's group, cost of use and how costing would be handled, and how users would gain access (personal communication, proposal, etc.).

Requests for an instrument should specify how the instrument is to be used, whether by Principal Investigator (PI) and the PI research group only, or by the PI group as well as other investigators (facility instrument). These categories are defined below.

Investigator Instrument: An investigator instrument is an instrument acquired or developed by an investigator to support his or her research where he or she has full authority for its exclusive use and where there are no commitments to make the instrument available to other investigators.

Investigator Facility Instrument: An investigator facility instrument is an instrument acquired or developed by an investigator to support his or her research where an identified portion of its time is to be reserved for use by the PI but where an additional, specified portion of its time will be made available to other knowledgeable planetary program investigators and where all details of access, method of use, charging, and data rights are determined by the PI in negotiation with potential users.

Regional Facility Instrument: A regional facility instrument is an instrument of considerable cost or one which is limited to one location by virtue of its use on a specific beam source or telescope facility, but is acquired by a PI to support his or her research. A significant, specified portion of a regional facility instrument's time will be reserved for use by the PI, but a significant, specified portion of its time must be available to other planetary program investigators. Unlike an investigator facility instrument, however, all details of access, announcement of availability, assistance to be provided on its use and methods of use (whether hands on or by an operator), charges, and data rights must be documented and agreed to by NASA and the sponsoring institution before NASA support is provided.

Costs

If the instrument in question is to be acquired from commercial sources, only those costs directly associated with the acquisition, installation, and check-out of the instrument should be requested. No costs for maintenance or operation beyond the check-out period should be included. These must be requested in research proposals submitted to the appropriate discipline programs. If the instrument is to be developed by the investigator, all costs associated with the development and final check-out should be requested. Multiyear requests would be expected in these cases. In all cases, however, provision of an adequately documented cost section will facilitate evaluation, and if selected, improve the likelihood of a timely award. It is especially important that each relevant cost category (Direct Labor, Fringe Benefits, Overhead, and Other Direct Costs such as Computer Use, Equipment, Travel, etc.) be detailed, explained, and substantiated in the proposal. For example, Direct Labor costs should include a listing of each labor type, hours to be expended, and salary rates used to calculate the yearly costs. Travel requirements should be explained in terms of the number of trips (travelers) to each destination, their duration, and all associated costs broken down by airfare, per diem, and ground transportation. Equipment costs should be itemized with references as to the source of the estimates. Finally, the basis for costs based on rates (Fringe Benefits, Overhead, etc.) should be explained. A summary would also be useful wherein costs for each major cost category is given for each year of requested support, together with a total for each year and a grand total for all years requested.

IV. EVALUATION

Evaluation factors will be those employed in evaluation of proposals received in response to an NRA, given in Appendix B, with the following additions. In considering the relevance of the request to the NASA and research in planetary sciences objectives, attention will be focused on the value that would be added by the addition of the instrument capability to ongoing and anticipated research of the proposer, in particular, and to planetary science investigations in general. In evaluating the intrinsic merit of the request, additional factors that will be considered of equal weight to each of those listed in Appendix B (Section 13c) are the scientific merit of the original proposal to which the request is tied and the value that the new or enhanced capability would add to science and/or education beyond that offered specifically to planetary science.

The process to be followed in the evaluation is to have the equipment request reviewed by each discipline peer review panel during the full proposal review and in the context of research proposed. Those requests that most clearly meet the criteria outlined in terms of scientific merit, program balance, and funding as judged by the peer panels will be referred to a special panel composed of the pertinent OSS Discipline Scientists. This panel will consider all referred requests. Recommendations made by this panel will be referred to the Director, Research Program Management Division for final selection.

V. SELECTION

Requests that are selected for support will be funded through augmentations to the grants/contracts that provide support for the investigator's basic research program. If requests involve multiple year periods of performance, for development activities, for example, annual augmentation to the basic continuing grants/contracts may be provided upon receipt, review, and selection of supplement proposals.

OFFICE OF SPACE SCIENCE
STANDARD FORMS FOR PROPOSERS RESPONDING TO NASA RESEARCH
ANNOUNCEMENTS

PROPOSAL FORMS KIT

1. PROPOSAL COVER SHEET
 2. ABSTRACT FORM
 3. BUDGET SUMMARY FORM
 - In addition to this form, an organization may include its own budget forms.
 4. BUDGET PER YEAR FORM
 - In addition to this form, an organization may include its own budget forms.
 5. CURRENT AND PENDING SUPPORT FORM
 6. CERTIFICATION FOR DRUG-FREE WORKPLACE
 - This form requires a signature.
 7. CERTIFICATION FOR DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITIES
 - This form requires a signature.
 8. CERTIFICATION REGARDING LOBBYING (IF > \$100,000)
 - This form requires a signature.
- MAILING FORM UPDATE

OSS PROPOSAL COVER PAGE

NRA #:	NRA Title:
Program:	

Principal Investigator			
<i>Title</i>	<i>First Name</i>	<i>Middle Name</i>	<i>Last Name</i>
Department			
Company/Institution			
Street Address		City/Town	
State	Zip/Postal	Country	
Telephone	Fax	E-Mail Address	
Principal Investigator's Signature			Date

Proposal Title

Co-Investigator(s) Name	Institution	E-mail

Institutional Endorsement

Name of Authorizing Official	
Title	
Institution	
Signature	Date

Budget Summary				
	Year 1	Year 2	Year 3	Total Funding
Amount Requested				

ABSTRACT

Principal Investigator			
<i>Title</i>	<i>First Name</i>	<i>Middle Name</i>	<i>Last Name</i>
Proposal Title			

PROPOSAL BUDGET SUMMARY

FROM: _____ **to** _____

TITLE OF INVESTIGATION:

PRINCIPAL INVESTIGATOR/ INSTITUTION:

	A	(NASA USE ONLY) B	C
1. Direct Labor (salaries, wages, and fringe benefits)	_____	_____	_____
2. Other Direct Cost:			
a. Subcontracts/grants	_____	_____	_____
b. Consultants	_____	_____	_____
c. Equipment	_____	_____	_____
d. Supplies	_____	_____	_____
e. Travel	_____	_____	_____
f. Other	_____	_____	_____
3. Indirect Costs	_____	_____	_____
4. Other Applicable Costs	_____	_____	_____
5. Subtotal--Estimated Costs	_____	_____	_____
6. Less Proposed Cost Sharing	_____	_____	_____
7. Carryover Funds (if any)			
a. Anticipated amount	_____	_____	_____
b. Amount used to reduce budget	_____	_____	_____
8. Total Estimated Costs	_____	_____	XXXXXXXXXX
APPROVED BUDGET	XXXXXXXXXXXXXX	XXXXXXXXXX	_____

Instructions

1. Provide a separate budget form for each year of proposed research and a summary form.
2. Grantee estimated costs should be entered in the first column. Columns B and C are for NASA use only. Column three represents the approved grant budget.
3. Provide in attachments to the budget summary the detailed computations of estimates in each cost category, along with any narrative explanation required to fully explain proposed costs.

additional Instructions on Next Page

Specific Costs

1. Direct Labor (salaries, wages, and fringe benefits). Enclosures should list number and titles of personnel, amount of time devoted to the grant, and rates of pay.
2. Other Direct Costs:
 - a. Subcontracts - Enclosures should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting this effort.
 - b. Consultants - Identify consultants to be used, why they are necessary, time to be spent on the project, and rates of pay.
 - c. Equipment - List separately and explain the need for items of equipment exceeding \$1,000. Describe the basis for the estimated cost.
 - d. Supplies - Provide general categories of needed supplies, the methods of acquisition, estimated cost, and the basis for the estimate.
 - e. Travel - List the proposed trips individually, describe their purpose in relation to the grant, provide dates and destinations where known, and explain how the cost for each was derived.
 - f. Other - Enter the total of any other direct costs not covered by 2.a. through 2.e. Enclose an itemized list explaining the need for each item and the basis for the estimate.
3. Indirect Costs - Identify indirect cost rate(s) and base(s) as approved by the cognizant Federal agency, including the effective period of the rate. If unapproved rates are used, explain why and include a computational basis for the indirect expense pool and corresponding allocation base for each rate.
4. Other Applicable Costs - Enter the total of any other applicable costs not covered by 1. through 3. Enclose an itemized list explaining the need for each item and the basis for the estimate.
5. Subtotal - Estimated Costs - Enter the sum of items 1., 2.a., through 2.f., 3., and 4.
6. Less Proposed Cost Sharing (if any) - Enter the amount proposed, if any. If cost sharing is based on specific cost items, identify each item and amount in enclosures.
7. Less Carryover Funds (if any) - Enter the dollar amount of any funds that are expected to be available for carryover from the prior budget period.
8. Total Estimated Costs - Enter the total after subtracting items 6. and 7. from item 5.

PROPOSAL BUDGET PER YEAR

FROM: _____ to _____

TITLE OF INVESTIGATION:

PRINCIPAL INVESTIGATOR/ INSTITUTION:

	A	(NASA USE ONLY) B	C
1. Direct Labor (salaries, wages, and fringe benefits)	_____	_____	_____
2. Other Direct Costs:			
a. Subcontracts/grants	_____	_____	_____
b. Consultants	_____	_____	_____
c. Equipment	_____	_____	_____
d. Supplies	_____	_____	_____
e. Travel	_____	_____	_____
f. Other	_____	_____	_____
3. Indirect Costs	_____	_____	_____
4. Other Applicable Costs	_____	_____	_____
5. Subtotal--Estimated Costs	_____	_____	_____
6. Less Proposed Cost Sharing	_____	_____	_____
7. Carryover Funds (if any)			
a. Anticipated amount	_____	_____	_____
b. Amount used to reduce budget	_____	_____	_____
8. Total Estimated Costs	_____	_____	XXXXXXXXXX
APPROVED BUDGET	XXXXXXXXXXXXXX	XXXXXXXXXXXXXX	_____

Instructions

1. Provide a separate budget form for each year of proposed research and a summary form.
2. Grantee estimated costs should be entered in the first column. Columns B and C are for NASA use only. Column three represents the approved grant budget.
3. Provide in attachments to the budget summary the detailed computations of estimates in each cost category, along with any narrative explanation required to fully explain proposed costs.

additional Instructions on Previous Page

LIST CURRENT AND PENDING RESEARCH SUPPORT FROM ALL OTHER SOURCES

Include all current research support for all other sources. Also include the proposed project and all other research requiring a part of the PI's time. State the number of person months regardless of the source of the support.

Name of Principal Investigator _____

A. Current Support

1. Source of Support _____
2. Project Title _____
3. Award Amount _____
4. Period of Award _____
5. Person-Months _____

B. Pending Proposals (including supplement applications)

1. Source of Support _____
2. Project Title _____
3. Award Amount _____
4. Period of Award _____
5. Person-Months _____

Other Agencies to which this proposal, or parts thereof, has been submitted:

Duplicate this page as many times as needed to provide a complete list.

Certification Regarding Drug-Free Workplace Requirements Grantees Other Than Individuals

This certification is required by the regulations implementing the Drug-Free Workplace Act of 1988, 34 CFR Part 85, Subpart F. The regulations, published in the January 31, 1989 Federal Register, require certification by grantees, prior to award, that they will maintain a drug-free workplace. The certification set out below is a material representation of fact upon which reliance will be placed when the agency determines to award the grant. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of grants, or government wide suspension or debarment (see 34 CFR Part 85, Sections 85.615 and 85.620).

This grantee certifies that it will provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing a drug-free awareness program to inform employees about -
 - The dangers of drug abuse in the workplace;
 - The grantee's policy of maintaining a drug-free workplace;
 - Any available drug counseling, rehabilitation, and employee assistance programs, and
 - The penalties that may be imposed upon employees for drug abuse violations in the workplace;
- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will -
 - Abide by the terms of the statement; and
 - Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;
- (e) Notifying the agency within ten days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction;
- (f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d)(2) , with respect to any employee who is so convicted -
 - Taking appropriate personnel action against such an employee, up to and including termination; or
 - Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraph (a), (b), (c), (e), and (f).

Organization Name

PR/Award Number or
Proposal Name

Name and Title of Authorized Representative

Signature

Date

**Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions**

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211).

- (1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
 - (d) Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name

PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature

Date

Certification Regarding Lobbying

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000 for each such failure.

Organization Name

PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature

Date